## REMARKS

The purpose of the present Request for Continued Examination in this patent application is for the Office's consideration of a Declaration Under 37 C.F.R. 1.132 by Warren F. Knoff, an inventor of the present patent application.

For purposes of a complete disclosure, a further Declaration Under 37 C.F.R. 132 by Warren F. Knoff is being filed in Serial No. 10/996,897.

### Double Patenting Rejection

Paragraph 3 of the Final Office communication sets forth an obviousness-type double patenting rejection of claims 1-12 based on claims 1-20 of patent application Serial No. 10/996,897. The Office position states:

> Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims are obvious variants over one another.

The rejection is respectfully traversed. Although both patent applications are directed to a fabric which increases in thickness (upon exposure to heat or flames), both patent applications are patentably distinct. Illustratively Serial No. 10/996,897 requires ridges and grooves which limitation is absent as a requirement in the present patent application. The added limitation imparts a patentable distinction.

Paragraph 4 of the Final Office communication sets forth an obviousness-type double patenting rejection of claims 1-12 based on claims 1-8, 10, and 11 of patent application Serial No. 11/017045 employing the same wording as paragraph 3 in support of the rejection.

This rejection is respectfully traversed. Again both patent applications are directed to a fabric which increases in thickness. However, Serial No. 11/023153 requires a liquid impermeable polymeric layer which limitation is absent as a requirement in the present patent application. The added limitation imparts a patentable distinction.

### Rejection Under 35 U.S.C. 103(a)

As set forth in the introduction in this response, reliance is placed on the attached Declaration Under 37 C.F.R. 1.132 of Warren F. Knoff. Therefore, a

majority of the traversal of the Office rejections in this response are quotations from this Declaration.

The initial portion of Dr. Knoff's Declaration sets forth his education and work experience for 33 years. Also, Dr. Knoff sets forth that he is a DuPont Fellow. For informational purposes, the title of a DuPont Fellow is awarded only to a handful of researchers within the DuPont Company.

The initial rejection under 35 U.S.C. 103(a) is set forth in paragraph 6 of the Office communication of February 23, 2006 of claims 1-23 based on (1) Erb, Jr. et al. (U.S. 2002/0182967) in view of (2) Matsuda et al. (U.S. 5,316,834), and (3) Assink et al. (U.S. 2004/0028958) [also referenced in this Declaration as Erb, Jr., Matsuda, and Assink].

The Declaration initially addresses the following statement in the Office rejection:

> Erb, Jr. fails to disclose that the p-aramid fibers are crimped and that the p-aramid fibers are held in a compressed state by a thermoplastic binder.

Also, the Declaration notes the following wording of the combination of the three publications, namely:

> It would have been obvious to have used Matsuda's crimping process on the fibers of Erb, Jr. et al. and Assink et al., motivated by the desire to create a fabric that is lightweight and has excellent mechanical properties. It also would have been obvious to have used Assink's polyester fiber binder or polyester powder binder on the fabric of Erb, Jr. et al. and Matsuda et al., motivated by the desire to create a fabric having greater strength and load-bearing properties.

Prior to a discussion of the inapplicability of the publications, the Declaration quotes the present patent application concerning a property of entanglement present on page 14, lines 14 to 16 and the paragraph bridging pages 6 and 7 of the present patent application as follows:

> The fabric is capable of increasing its thickness in response to high heat or flame because the crimped heat-resistant organic fibers are compressed but not appreciably entangled in the fabric. . .
>
> ▪ ▪ ▪

> The fabrics of this invention have only enough entanglement of the fibers to manufacture the sheet; that is, the fibers are only entangled with each other to the extent needed to form a lightweight web that can be overlaid or combined with the open mesh scrim. No additional energy is imparted to the sheet to either entangle the fibers with each other or with the scrim. The lightweight web is then laminated to the scrim by heating and compressing the combination and then cooling the combination to set the structure while the crimped fibers are compressed and restrained. By compressing a lofty sheet in this manner, when the binder material is softened or melts, the fibers are free to return to a formally lofty state similar to the one they had prior to compression.

Thereafter the Declaration continues in addressing the inapplicability of the three publications as follows:

That I consider that one of ordinary skill in the art would not modify Erb (it "fails to disclose that the fibers are crimped, that the fibers are held in a compressed state by a thermoplastic binder" in the Office wording) as has been suggested. The construction of Erb is a needled felt which achieves its strength and mechanical properties by means of a high level of mechanical entanglements introduced via the needling process. Even if a thermoplastic binder was included in the construction of Erb, it would not increase in thickness when heated **because of the entanglements introduced by the needling process**.

That I consider that the teaching of Matsuda regarding entanglement represents a disclosure and teaching which is no more applicable than what is admitted to be old in the prior art which is set forth on page 6, lines 16 to 23 as follows:

> . . . while previously developed fiber-scrim sheets have concentrated on ensuring a high level of mechanical entanglement of the fibers with the scrim and or with the other fibers in the sheet. Typically, this mechanical entanglement is done by the imparting energy into lofty webs of fibers and/or the scrim that form the sheet to entangle the fibers and densify the sheet. **When this is done, the fibers of the sheet are so entangled they are not free to move when subjected to heat and flame.** (emphasis added)

That I consider the disclosure of Matsuda that requires a high degree of entanglement in the heat resistant fiber structure (column 5, lines 6-8) creates a

structure in which the fibers "are so entangled they are not free to move when subjected to heat and flame."

That I provide the following explanation in support of the statements made in the preceding paragraphs as follows:

The nonwoven structures comprising heat resistant fibers of both Erb and Matsuda (here, the nonwoven structure prior to impregnation) are held in a compressed state by and derive strength and mechanical properties from fiber entanglements introduced either by needles or water jets. The nonwoven structure of my invention is held in a compressed state by the thermoplastic binder, not fiber entanglements. As shown in the table below, all three of these structures have similar "bulkiness" as defined by Matsuda (this value is simply the ratio of fiber density to the structure density).

| **Inventor** | **Example** | **Bulkiness** |
|---|---|---|
| Matsuda | 1 | 9 |
| Erb | 1 | 8.1 |
| Bascom et al | 1 | 12 |

The difference between the structures of Erb or Matsuda and the structure of my invention is the response to heat or flame. The structures of Matsuda and Erb are held in their compressed state by non-labile fiber entanglement. When exposed to heat or flame, the crimp in the heat resistant fibers **is not released**. They do not increase in thickness or bulkiness or return to the dimensions of the fiber structure prior to the needling or water jetting. When the structure of my invention is exposed to heat or flame, the labile interfiber bonds holding the structure in its compressed state will release and the structure will increase in thickness at least three times the original (3x increase in bulkiness also) as the stored energy in the heat resistant fibers is released and the structure returns to its uncompressed state.

That I further consider the additional disclosure of Matsuda to require that the structure of heat resistant fibers be formed by impregnation of the thermoplastic matrix (column 5, lines 30-32) and that the heat resistant fibers are substantially uniformly distributed in the matrix in the sheet cross section (column 5 lines 1-3) to be

clear evidence that the final structure would not possess the necessary ability to increase its thickness when exposed to heat or flame.

That I provide the following explanation in support of the statement made in the preceding paragraph as follows:

Impregnation of the thermoplastic matrix into the heat resistant fiber structure means that the molten matrix material flows into the structure and fills the voids. This is consistent with the accepted definition of impregnation: "to fill or saturate: cause to be permeated [clothing impregnated with smoke)" (Webster, 2nd College edition 1986). The requirement of impregnation along with the requirement that the fibers be substantially uniformly distributed in the matrix in the sheet cross section along with the lack of any other teaching regarding how to introduce the matrix essentially eliminates the possibility that Matsuda was introducing significant added lateral compression (thickness reduction) during the lamination process that would be held by the solidified matrix and possibly be released if the object was exposed to heat or flame.

That I consider one of ordinary skill in the art (1) would not be led by obviousness to combine the disclosure of Erb, Jr. et al. and Matsuda and (2) for the purpose of argument, even if combined, would obtain an article that would not, increase in thickness at least three times when subjected to heat and flame.

That I consider the disclosure and teachings of Assink for use of a binder fiber or binder powder to be inapplicable to cure the deficiency in any combination of Erb and Matsuda because, as has been discussed above, the structures of Erb and Matsuda are entangled structures and even if a thermoplastic binder was included they would not have the capability to increase in thickness at least three times.

That I further consider the disclosure and teachings of Assink to be inapplicable because:

1. The Office asserts that “the binder component acts as an adhesive and binder to hold the fibers in a relatively rigid configuration”
2. Assink anticipates that his article will not change shape by stating [0048] “Then the shaped laminate is cooled to allow the binder component of the laminate to set, permanently fixing the molded shape.”

The Declaration addresses the following statement in the Office rejection:

That I note the following statement in the Office communication:

**Regarding claims 1-3, although Erb, Jr. et al., Matsuda et al., and Assink et al. do not specifically teach that when the fabric is exposed to heat or flame it increases its thickness by at least three times, or five times, or ten times, it is reasonable to presume that this property is inherent to the invention of Erb, Jr. et al., Matsuda et al., and Assink et al.. Support for said presumption is found in the use of like materials (i.e. a scrim, crimped organic fibers, thermoplastic binder). The burden is upon Applicant to prove otherwise.**

(emphasis in original wording)

The Declaration addresses this Office wording as follows:

That I consider this presumption, which is supported only by the fact that combined article contains like materials, to be incorrect and believe that I have effectively stated in the above paragraphs that indeed any such hypothetical combination where the method of assembly and final configuration are not clearly specified lies outside the disclosure and teachings of my patent application.

A further rejection is set forth in the Office communication of claims 1-4 and 6-12 based on Corner/U.S. 2003/0232560 [which replaces Erb in comparison to paragraph 6] in view of Matsuda and Assink.

The Declaration notes the following wording in the Office communication and states:

> Corner fails to disclose that the p-aramid fibers are crimped and that the p-aramid fibers are held in a compressed state by a thermoplastic binder.
>
> (and accordingly represents identical wording set forth in paragraph 10 except for replacing "Erb" with –Corner--]

That I note the following discussion of Corner in the Office communication:

> Corner (US 2003/0232560) discloses flame resistant fabrics having increased strength. The flame resistant fabric includes a plurality of flame resistant body yarns that form a body of the fabric and a plurality of relatively tough yarns provided in discrete positions within the fabric body (abstract). The tough yarns arranged in a grid (i.e. scrim) pattern in which several body yarns are placed between each consecutive tough yarn in both the warp and weft direction [0025]. The body yarns can be para-aramid flame resistant fibers [0023] and tough yarns comprise flame resistant polyester [0031]. It should be noted that the

> Examiner is equating the crimped organic fibers on the first side disclosed in the present invention to the p-aramid body yarns of Corner.

The Declaration considers the disclosure and teachings of Corner to be deficient for the following reasons:

The fabric of Corner is a woven fabric [0022] which comprises a majority of spun yarns [0023] plus "relatively tough yarn" which is a combination of spun and continuous filament yarns. The woven fabrics comprising heat resistant fibers of Corner are held in a compressed state derive their strength and mechanical properties from orderly and repeating mechanical entanglements in the form of the twist in spun yarns and the interlocking lay of the yarns over and under each other (The nonwoven fabrics of Erb and Matsuda contain random mechanical entanglements). The mechanical entanglements of Corner are non-labile, and when the fabric is exposed to heat or flame, the crimp in the heat resistant **fibers is not released**. The fabric will not increase in thickness nor will the heat resistant fibers return to their form prior to the yarn spinning and fabric weaving. Even if a thermoplastic binder was incorporated into the fabric of Corner, it would not increase in thickness because of the mechanical entanglements introduced during the spinning and weaving process.

That I consider my previous remarks to be applicable concerning the deficiencies of Matsuda and Assink and accordingly conclude that the combination of Corner, Matsuda, and Assink not to be relevant opposite my patent application.

The Declaration then addresses highlighted wording in the Office rejection as follows:

That I note the following wording in the Office communication (wherein "Erb" is replaced by –Corner—in employing identical language previously quoted in this Declaration) as follows:

**Regarding claims 1-3, although Corner, Matsuda et al., and Assink et al. do not specifically teach that when the fabric is exposed to heat or flame it increases its thickness by at least three times, or five times, or ten times, it is reasonable to presume that this property is inherent to the invention of Corner, Matsuda et al., and Assink et al.. Support for said presumption is found in the use of like materials (i.e. a scrim, crimped organic fibers, thermoplastic binder). The burden is upon Applicant to prove otherwise.** (emphasis in Office wording)

That I consider my remarks concerning the combination of Erb, Matsuda, and Assink to have shown error in any substitution of Erb with Corner.

Accordingly, the Declaration concludes:

That in summary I consider one of ordinary skill in the art would

(1) not combine the disclosure and teachings of Erb or Corner in view of Matsuda and Assink et al.

(2) not result, if combined, in an article within the scope of my patent application.

In summary Applicants rely on the enclosed Declaration in traversal of the Office rejection under 35 U.S.C. 103(a). The double patenting rejections are not considered applicable. Removal of all rejections is requested. In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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AGG:fgl
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